

Astronomy & Physics Division Overview

Presented to

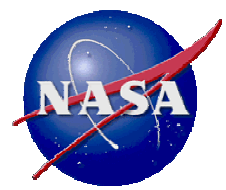
OS/SEUS

Dr. Anne L. Kinney

Director

Astronomy and Physics Division

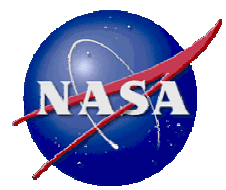
February 24, 2004



President's Vision and Changes

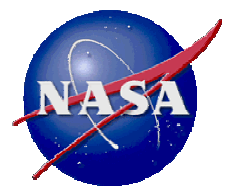
"Conduct advanced telescope searches for Earth-like planets and habitable environments around other stars."

- Astronomical Search for Origins Changes:
 - HST SM-4 cancelled due to safety considerations.
 - Examine ways to extend operational life without additional servicing.
 - De-orbit via an autonomous rendezvous mission.
 - JWST funding profile shifted forward for schedule recovery/assurance.
- Structure and Evolution of the Universe:
 - LISA delayed one year.
 - Con-X delayed two years.
 - Einstein Probes deferred indefinitely (beyond the current budget horizon).
 - Some additional funding provided to GP-B, Swift, and GLAST.

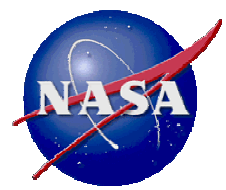


Significant Events

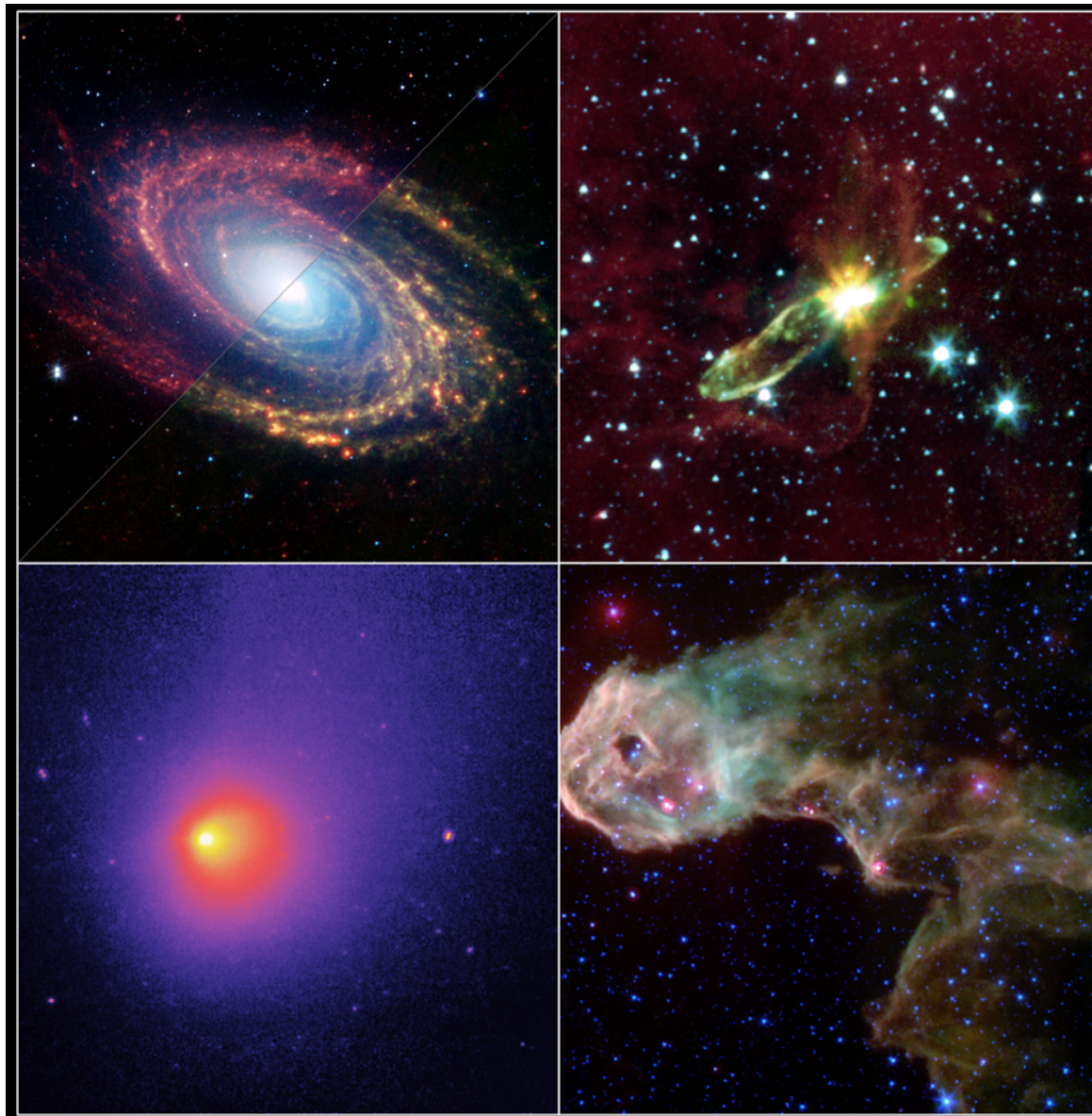
- GLAST passed confirmation review to enter Phase C/D.
- SIM and JWST SRR's completed.
- Space Science Update held for Chandra.
- CHIPS Prime mission ended in January 04.



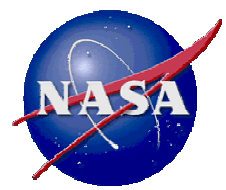
JWST Deployment Movie



Spitzer - First Releases



SSC-2003-06k



Space Science Updates

RXTE: Cosmic Speed Limit on Pulsars

July 2, 2003

Hubble: Oldest Known Planet

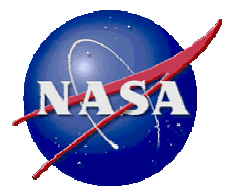
July 7, 2003

Chandra: Black Hole Sound Waves

September 9, 2003

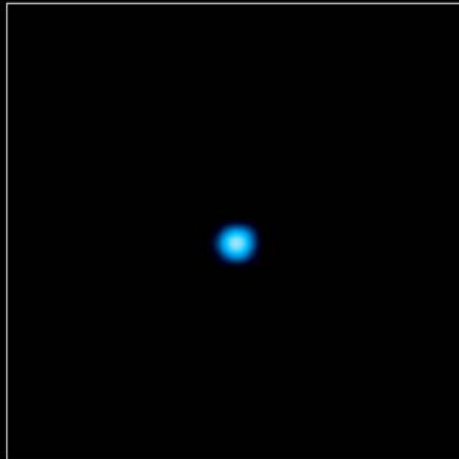
Chandra: Giant Black Hole Rips Star Apart

February 18, 2004

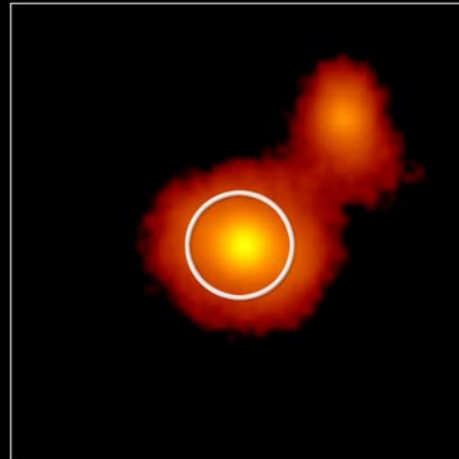


Chandra SSU

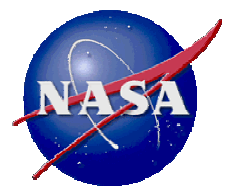
Giant Black Hole Rips Star Apart



CHANDRA X-RAY



ESO OPTICAL



Upcoming Launch GP-B

Launch:

April 17, 2004

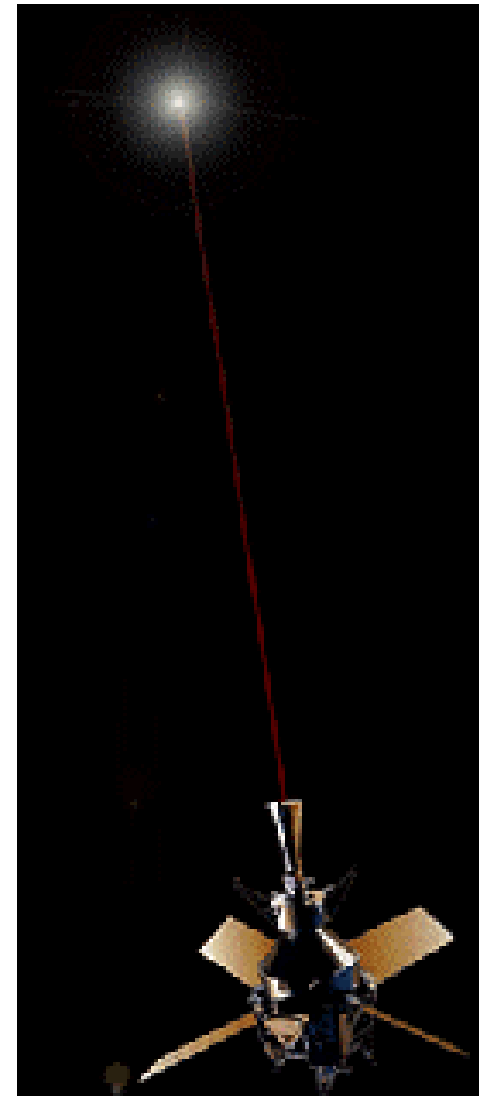
VAFB, CA.

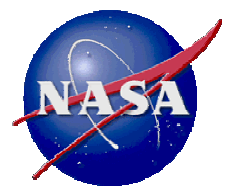
Launch Vehicle:

Delta II

Primary Science Objective:

Gravity Probe B uses four gyroscopes developed to test two predictions of Albert Einstein's general theory of relativity. While in a polar Earth orbit, it will measure how space and time are warped by the presence of the Earth, and how the Earth's rotation drags space-time around with it.





Upcoming Launch SWIFT

Launch:

September 2004

Cape Canaveral, FL.

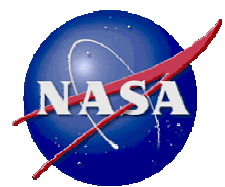
Launch Vehicle:

Delta 7320

Primary Science Objective:

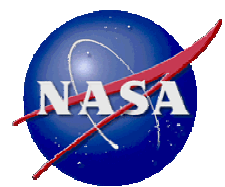
The primary objective of the SWIFT mission is to determine the origin of Gamma Ray Bursts and to use them to probe the early universe.





Astronomy and Physics Operating Missions Status

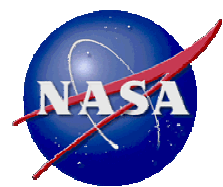
Launch/EOM		Dec	Jan	Feb	STATUS
HST (Prime)	4-25-90	GRN	GRN	GRN	HST scheduled to complete Prime mission 2005.
	4-30-10				
Rossi XTE (Extended)	12-30-95	GRN	GRN	GRN	
	9-30-05				
2MASS (Extended)	4-1-97	GRN	GRN	GRN	
	9-30-04				
SWAS (Extended)	12-3-98	GRN	GRN	GRN	Spacecraft is now in inertial hold awaiting water measures on Mars and Venus in Jan/Feb 2004. Program terminates on 7-31-04
	7-31-04				
FUSE (Extended)	6-24-99	GRN	GRN	GRN	
	9-30-05				
Chandra XO (Prime)	7-19-99	GRN	GRN	GRN	107 ksec science time lost on 1/23 due to high Solar activity.
	7-19-10				
XMM-Newton (Prime)	12-9-99	GRN	GRN	GRN	
	12-9-04				
HETE-2 (Ext-Extended)	10-8-00	GRN	GRN	GRN	
	7-31-04				
WMAP (Extended)	6-30-01	GRN	GRN	GRN	
	9-30-05				
Integral (Prime)	10-17-02	GRN	GRN	GRN	
	9-21-04				
CHIPS (Extended)	1-15-03	GRN	GRN	GRN	
	7-12-04				
GALEX (Prime)	4-28-03	YEL	GRN	GRN	
	8-25-05				
Spitzer (Prime)	8-25-03		GRN	GRN	Standby mode entered on 2/5 due to Combined Electronics package suspend. Cause known and fixed. 10 hrs of science time lost when timeline resumed.
	5-25-06				



Astronomical Search for Origins Developmental Missions Status

	Launch	Dec	Jan	Feb	STATUS
SIRTF/Spitzer	Aug '03	GRN			Now reported on the Operational Missions chart.
HST	Jun '06	GRN	GRN	GRN	Two gyro mode on schedule.
		RED		GRN	Project established. RFI released Feb 23rd.
SOFIA	Apr '05	YEL	YEL	YEL	Held the EPMC on January 28, 2004. Overall program schedule evaluation underway.
Keck Interferometer	2005	YEL	YEL	YEL	V2 ORR delayed 3 months; Nuller technical difficulties (end-to-end null depth).
		RED	RED	RED	State Hearing Officer approves Management Plan, recommends permit approval.
LBTI	Sep '06	GRN	GRN	GRN	On-site installation review planned for March.
Kepler	2007	GRN	GRN	GRN	Conducted Optic and CCD CDRs.
SIM	Dec '09	GRN	GRN	GRN	Project has met with SIRTF on Lessons Learned.
JWST	Aug '11	GRN	GRN	GRN	Optic summit held January 27-29th, resolving several optical interface issues.
					Launch vehicle interagency discussion started.
TPF	tbd	GRN	GRN	GRN	Sent letter to CAA requesting assessment of proposed science definition.

GRN	Proceeding on Plan, only normal, minor problems
YEL	Significant Problems or Concerns but feasible plan to resolve
RED	Major Problems; Solution path unclear



Structure and Evolution of the Universe

Developmental Missions Status

	Launch	Dec	Jan	Feb	STATUS
GP-B	Apr '04	RED	YEL	YEL	ECU was removed, reworked, tested, and reinstalled in space vehicle. System-level regression testing has started.
SWIFT	Jul '04	RED	RED	YEL	Cost Cap was raised, eliminating the funding problem. Image processor problem taking longer to solve than planned.
Astro-E2	Feb '05	RED	YEL	YEL	XRS delivery to Japan scheduled for March 12. Projected FY04/FY05 cost overrun (\$3M) will exceed mission cost cap.
GLAST	Feb '07	GRN	YEL	YEL	New LAT tracker structural interface design approved. LAT FSW development monitoring in place. LAT ACD PMT failure potential causes and fixes identified and under analysis.
Herschel	2007	RED	YEL	YEL	Project estimates need for \$3.5M increase in FY05. Production of instrument components going well.
Planck	2007	YEL	YEL	YEL	Possible reduced cryocooler lifetime is still an issue. Production of instrument components is going well.
EUSO	2008	GRN	RED	RED	Availability of Shuttle for launch is now uncertain.
LISA	2011	GRN	YEL	YEL	Drafting a management framework white paper with ESA, to be completed by the end of March.
Con-X	2013	GRN	GRN	GRN	Replan underway due to reduced funding profile FY04-FY09. Project Manager has been reassigned. Current Deputy will become Project Manager.
Balloons	Ongoing	GRN	GRN	GRN	Schedule for new Antarctica facilities shows setup completed by October 2005.

GRN

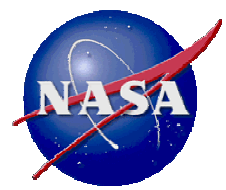
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YEL

Significant Problems or Concerns but feasible plan to resolve

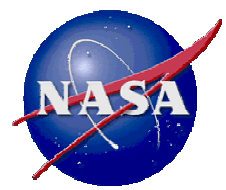
RED

Major Problems; Solution path unclear



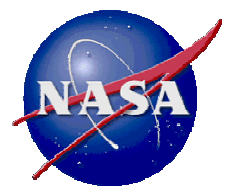
ROSS-04: Astronomy & Physics

- Applied Information Systems (ROSS-03) Mar 10
- Astronomy and Physics Research and Analysis April
- Cosmochemistry May
- Origins of Solar Systems May
- Terrestrial Planet Finder Foundation Science May
- Astrophysics Data Analysis June
- Long-Term Space Astrophysics June
- Astrophysics Theory August
- Beyond Einstein Foundation Science August



ROSS-04: Astrobiology & Other

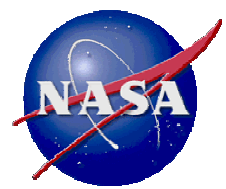
- Discovery Data Analysis March
- Mars Research, Mars Instrument Development April
- Planetary Atmospheres April
- Sun-Earth Connection Theory April
- Planetary Geology and Geophysics May
- Astrobiology Science & Technology for Exploring Planets May
- Sun-Earth Connection Guest Investigators May
- Near Earth Object Observations June
- Sample Return Laboratory Instruments & Data Analysis June
- Planetary Astronomy June
- Geospace Sciences July
- Astrobiology: Exobiology and Evolutionary Biology August
- Planetary Protection August
- Planetary Instrument Definition and Development August
- Mars Data Analysis August
- Living With a Star Targeted Research & Technology October
- Astrobiology Instrument Development & Mission Concepts November
- Solar and Heliospheric Physics Feb 05



GO Programs

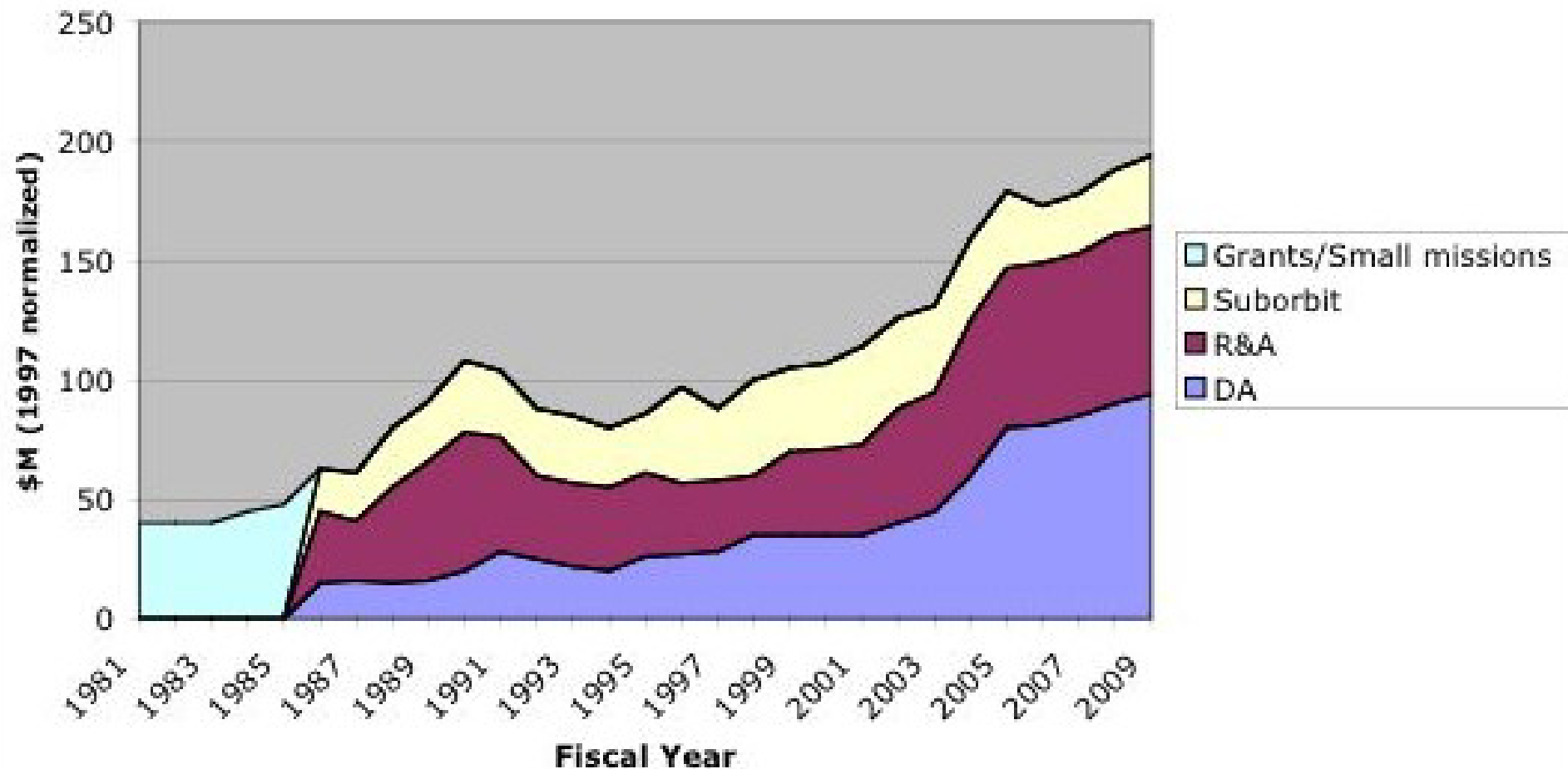
- Hubble – Cycle 13 Jan 23
- SIRTf – Cycle 1 Feb 14
- Chandra – Cycle 6 Mar 12
- GALEX – Cycle 1 (ROSS) April
- Astro-E2 – Cycle 1 (ROSS) Summer
- RXTE – Cycle 10 (ROSS) September
- FUSE – Cycle 6 (ROSS) September
- SWIFT – Cycle 2 (ROSS) December

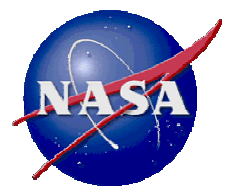
- INTEGRAL – Cycle 3 (ESA) ~ Sep
- XMM-Newton – Cycle 4 (ESA) ~ Nov



R & A Budget History 1981-2009

R & A Budget History





A&P Division Key Issues

- Launch GPB.
- HST optimization.
 - Extend operating life of HST.
 - Optimize science program.
- Plan for and implement safe deorbit mission.
- Swift Launch delayed.
- Future of SEU.
 - Beyond Einstein budget reduced in FY05 and out.
- Astronomy and Physics Roadmapping - again!
 - In context of new NASA direction.
- Note Vision Missions announced and Origins Probes on the street.